Strategic Road Map
"Utility Perspective"

U.S. Department of Energy Distributed Energy and Electric Reliability Program

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What does a utility need to expedite the implementation and use of DR's?

- Approved Interconnection Guidelines From (Public Utilities Commission)
- Approved Interconnection Standard
- Technical Expertise To Evaluate What Is The Best Use Of DR's On The EPS
- Modeling Tools To Study The Effects Of DR's On The EPS (29 Issues)
- Monitoring And Control System Including Telecommunications
- Certified DR Interconnection Equipment Which Is Economic And Reliable
- Installation Inspectors
- Operating Procedures And Trained Operators (EPS)
- DR Tariffs/Rates/Incentives

What does a utility need to expedite the implementation and use of DR's? (con't.)

- Cooperation From Planning Commissions, Zoning Boards, And Building Code Inspectors
- Proactive Approach To Inform Customers/Contractors/Consultants Of Alternative DR Approaches To Expedite Installation And Reduce Costs Of Utility Infrastructure
- Allow Utilities (& Subsidiaries) To Participate Competitively In The Development, Implementation, And Operation Of DR's
- Design Highly Automated Distribution Circuits With Telecommunication Features

❖ Approved Interconnection Guidelines from (Public Utilities Commission)

- Outline Utility Policy And Process
- Applicable Fees
- Interconnection Requirements
  - System Protection
  - Telemetering
  - Revenue Metering
  - Maintenance & Testing
- Application (Generator Information) And Utility Information
- Interconnection Study Description

❖ Approved Interconnection Standard

- Technical Requirements
  - Technology Neutral Functional Description Of System Protection Equipment

- Testing Requirements
  - National Recognized Test Laboratory (NRTL) – Type Testing
  - In-Commission Testing

❖ Technical Expertise to Evaluate What is the Best Use of DR's on the EPS

- Apply Interconnection Guidelines
- Apply Interconnection Standard
- Knowledge Of Characteristics Of Energy Conversion Equipment And Characteristics Of Power System
- Familiarity With EEI 29 Issues And Solutions
- Knowledge Of Building Codes
- Resource Network IEEE, EPRI, DOE, UL, CE, etc.

❖ Modeling Tools to Study the Effects of DR's on the EPS (29 Issues)

- Load Flow (PSLF)
- Short Circuit (ASPEN)
- Relay Coordination (ASPEN)
- EMTP Electric Magnetic Transients Program
- PTI PSS/E – Stability
- DEW – Distribution Engineering Workstation
- MATLAB – Modeling Controls

FUTURE

- Effects Of Unbalanced Loading On Single Phase Voltage Regulation Including DR's
- Generation And System Planning With DR's Including (Both Load Forecasting, Load Management, etc.)

❖ Monitoring and Control System Including Telecommunications

- System Wide Integrated Telecom System to Expedite Installation
- Common Protocols And Standardized (Inter-Operability) Telecom Equipment
- Utility Dispatch Capability
- Data Storage & Retrieval For Operations And Billing

❖ Operating Procedures and Trained Operators (EPS)

- Line Persons
- Service Persons
- Substation Operators
- System Operators

❖ DR Tariffs/Rates/Incentives

- Demand Response
- Incentive Rate To Provide A Capacity Credit To DR's For Reducing Peak Demands – Deferring Utility Generation And T&D Capacity
- Low Standby Charges For Loss Of Customer Generation
- Reliability Credit For Loss Of Distribution
- Property Access For DR Installation On Utility Easements / R/W
- Property Tax Reduction For Self Generation (Or No Increase In Property Tax For Self Generation)
- Utility Provides Environmental Credits To DR's
- DR Efficiency Credit For Net Efficiency Improvement

- **Proactive Approach to Inform Customers/Contractors/Consultants of Alternative DR Approaches to Expedite Installation and Reduce Costs of Utility Infrastructure**

  - **Power Quality**
  - **Reliability**
  - **CHP Applications**
  - **Neutral Utility/Customer Benefits Of DR (Costly Line Extension Avoided)**

❖ Allow Utilities (& Subsidiaries) to Participate Competitively in the Development, Implementation, and Operation of DR's

- Best Position To Implement
- Select Best Solution – Balanced Perspective
- Equity Position
- Better Designed DR Equipment
- Results In Expedited Utility/Customer DR Processes

- **Design Highly Automated Distribution Circuits with Telecommunication Features**

  - Automated Circuits Usually Have Telecommunication Links To Circuit Devices
  - Easier To Implement DR With Distribution Automation Circuits
  - Island Operation Easier With Remote Controlled Sectionalized Circuits
  - Monitoring And Control Already Exists – Information on Real Time Operation Of Circuit
  - Benefits Are Easier To Evaluate Since Information Exists
  - Improves Reliability